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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,657	11/04/2005	Tsumoru Ohata	043888-0412	9671

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EXAMINER	
LEE, CYNTHIA K	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/555,657	OHATA ET AL.	
	Examiner	Art Unit	
	CYNTHIA LEE	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-10 and 12-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10,12-15,23 and 24* is/are allowed.

6)☒ Claim(s) *1,2,4-9,16-22 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/21/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/21/2008 has been entered.

Response to Amendment

This Office Action is responsive to the amendment filed 2/21/2008. Claims 3 and 11 have been canceled. Claims 21-25 have been added. Claims 1, 2, 4-10, 12-25 are pending.

The 35 USC 112, 2nd paragraph rejection has been withdrawn.

The Objection to the Claims has been withdrawn.

Claims 10, 12-15, 23, and 24 are allowed.

Claims 1, 2, 4-9, 16-22, and 25 are non-finally rejected for reasons stated herein below.

Information Disclosure Statement

The Information Disclosure Statement (IDS) filed 2/21/2008 has been placed in the application file and the information referred to therein has been considered.

Claims Analysis

Support for claim 10 wherein "a plurality of single crystalline particles bonded to each other" and "partially melting said plurality of single crystalline particles" and claim

16 wherein "polycrystalline particles comprising a plurality of single crystalline particles that are diffusion bonded to each other" are supported by the Specification par. [0022, 0023].

To avoid 35 USC 112, 2nd paragraph issues, the limitation "indefinite-shape particle" has been defined as "shapes having knots, bumps, or bulges based on the primary particles, that is, for example, shapes like dendrite, grape clusters, or coral, unlike shapes that are spherical or egg-shaped, or that are similar to such shapes" as supported by the Specification pg 5 paragraph [0009].

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4-6, 8, 9, 16-19, 21, 22, 25 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Koike (JP 07-220759).

Koike discloses a secondary battery comprising a positive electrode, a negative electrode, a coating film (applicant's porous electron-insulating layer) adhered to the anode (see working example 2). A separator is present comprising a fine porous film. The coating comprises a slurry of alumina powder and PVdF mixed in n-methyl pyrolidone.

Koike does not expressly disclose that the slurry comprises indefinite shape particles comprising dendrites, grape clusters, or coral. Although Fig. 1 and 2 of Koike discloses spherical particles aligned, the Examiner notes that they are merely illustrative and not drawn to scale. Because of the presence of the binder (PVdF), the alumina particles mixed with PVdF will naturally (or inherently) form indefinite shapes, such as dendrites, grape clusters, or coral.

Regarding the limitation "wherein said indefinite-shape particles comprise a plurality of primary particles bonded to each other, said indefinite-shape particles having bonding portions of said primary particles, said bonding portions comprising the same material as said primary particles" in claim 1 and the particle dimensions of claim 4, it is noted that the primary particles are not present as distinct particles in the final product. It is further noted that Koike's particles are naturally not a perfect sphere. Thus, bumps/irregularities on a single particle are interpreted as the "primary particles" and the portions in between the irregularities within a single particle are interpreted as "bonding portions".

Regarding claim 4 and 12, Koike discloses that the particle size of the fine particles is between 0.1 um to 50 um, preferably from 5 um to 10 um [0030]. Thus, "the primary particle" would not be more than 10 um.

The Examiner notes that claim 16 is a product-by-process claim. The claim does not specify to what extent the particles are bound by the diffusion bonding process. According to the process, a plurality of primary particles fused together would form one large particle. Thus, it is noted that each fine particle of Koike aggregates to form indefinite shape particles and the portions that in which two particles touch without a binder in between the two particles reads on the product made by the process. Further, each of the fine particles of alumina is inherently crystalline and would be indistinguishable from a particle that is formed by several crystalline particles without a binder in between those particles.

Claims 1, 2, 4-6, 9, 16-19, 21, 22, 25 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464).

Delnik discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode. See fig 1. A separator is present comprising a fine porous film. The precursor separator solution comprises silica filler and a polymer binder (see

Abstract). The separator comprises indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral. See Fig. 2.

Regarding the limitation "wherein said indefinite-shape particles comprise a plurality of primary particles bonded to each other, said indefinite-shape particles having bonding portions of said primary particles, said bonding portions comprising the same material as said primary particles" in claim 1 and the particle dimensions of claim 4, it is noted that the primary particles are not present as distinct particles in the final product. It is further noted that Koike's particles are naturally not a perfect sphere. Thus, bumps/irregularities on a single particle are interpreted as the "primary particles" and the portions in between the irregularities within a single particle are interpreted as "bonding portions".

Regarding claim 4 and 12, Koike discloses that the particle size of the fine particles is between 0.1 um to 50 um, preferably from 5 um to 10 um [0030]. Thus, "the primary particle" would not be more than 10 um.

The Examiner notes that claim 16 is a product-by-process claim. The claim does not specify to what extent the particles are bound by the diffusion bonding process. According to the process, a plurality of primary particles fused together would form one large particle. Thus, it is noted that each fine particle of Koike aggregates to form indefinite shape particles and the portions that in which two particles touch without a binder in between the two particles reads on the product made by the process. Further, each of the fine particles of alumina is inherently crystalline and would be

indistinguishable from a particle that is formed by several crystalline particles without a binder in between those particles.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4, 8, 9 are rejected under 35 U.S.C. 103(a) as obvious over Takata (US 6638988).

Takata discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode (6:55-7:15). A separator is present comprising a porous film. The separator is made of hydrotalcite and polypropylene resin and the mixture is kneaded by a biaxial kneader. See Example 1.

Takata does not disclose indefinite shape particles. However, Takata discloses of using organic fillers. See 3:55-60 for the particular organic fillers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute hydrotalcite for Takata's organic filler because organic fillers and inorganic fillers are art-recognized equivalents (3:40-45). See MPEP 2144.06. It is noted that when a mixture of organic fillers and a resin binder are kneaded in a kneader, the

organic filler particles will naturally aggregate and form indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral.

Regarding Applicant's claim 4, Takata discloses that the average particle size of the filler is mot more than about 1 um (59-65).

Regarding the limitation "wherein said indefinite-shape particles comprise a plurality of primary particles bonded to each other, said indefinite-shape particles having bonding portions of said primary particles, said bonding portions comprising the same material as said primary particles" in claim 1 and the particle dimensions of claim 4, it is noted that the primary particles are not present as distinct particles in the final product. It is further noted that Takata's particles are naturally not a perfect sphere. Thus, bumps/irregularities on a single particle are interpreted as the "primary particles" and the portions in between the irregularities within a single particle are interpreted as "bonding portions".

Another interpretation of claim 1 is that the claim does not specify to what extent the particles are bonded. According to the process, a plurality of primary particles completely fused together would form one large particle. Thus, it is noted that each fine particle of Takata aggregates to form indefinite shape particles and reads on the product made by the process because primary particles do not exist in the final product.

Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art

product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983) The Applicants are also advised to provide evidence as to why the modified separator of Takata with the organic filler does not read on the instant set of claims.

Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Koike (JP 07-220759) as applied to claims 1 and 16, in view of Waterhouse (US 4363856).

Koike discloses all the elements of claim 1 and 16 and are incorporated herein. Koike does not disclose that the resin binder comprises a polyacrylic acid derivative. Koike discloses that the resin comprises PVdF resin. However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Koike's PVdF resin because it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Se MPEP 2144.07.

Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464) as applied to claims 1 and 16, in view of Waterhouse (US 4363856).

Delnik discloses all the elements of claim 1 and 16 and are incorporated herein. Delnik does not disclose that the resin binder comprises a polyacrylic acid derivative. Delnik discloses that the resin comprises PVC, PVdF, and EPDM resin (7:5-15).

However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Delnik's resin because it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Se MPEP 2144.07.

Claim 7 is rejected under 35 U.S.C. 103(a) as obvious over Takata (US 6638988) as applied to claim 1 in view of Waterhouse (US 4363856).

Takata discloses all the elements of claim 1 and are incorporated herein. Takata does not disclose that the resin binder comprises a polyacrylic acid derivative. Takata discloses that the resin comprisesa polyolefin (4:45). However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Takata's resin because it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Se MPEP 2144.07.

Response to Arguments

Applicant's arguments filed 2/21/2008 have been fully considered and only the relevant arguments will be addressed herein below:

Applicant asserts that organic fillers and inorganic fillers are not art equivalents because they have different melting points.

The Examiner remains unpersuaded. Although organic fillers and inorganic may have different melting points, Applicant has not refuted the Examiner's position that Takata clearly discloses organic fillers and inorganic fillers as being equivalents and the interchangeability of the two types of fillers. Takata discloses "The filler to be used in the porous film of the present invention may be either an inorganic filler or an organic filler." (3:40-41).

Applicant's arguments to the prior arts Koike, Delnik, and Takata are directed to the claims as amended. Thus, new interpretations of Koike, Delnik, and Takata were given and the Applicant's arguments are moot.

Allowable Subject Matter

Claims 10, 12-15, 23, and 24 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: Prior art does not disclose nor suggest "wherein indefinite-shape particles comprise a plurality of single crystalline particles bonded to each other and a neck is formed, by partially melting said plurality of single crystalline particles, between at least a pair of said single crystalline particles that are joined to one another, said neck comprising the same material as said single crystalline particles" of claim 10.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ckl
Cynthia Lee

/Susy N Tsang-Foster/
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